U.S. DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
BUREAU OF STANDARDS
LYMAN J. BRIGGS, Acting Director

FUEL OILS

(Second edition)

COMMERCIAL STANDARD CS12-33

[Issued June 14, 1933]

Effective Date, May 1, 1933

A RECORDED STANDARD OF THE INDUSTRY

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PROMULGATION STATEMENT

On January 9, 1929, a joint conference of representative refiners, distributors, and consumers of fuel oil, manufacturers of oil burners, and general interests, adopted a recommended standard for domestic and industrial fuel oils which was accepted in writing by the industry and published as Commercial Standard CS12-29.

On June 21, 1932, a well-attended meeting of section 1, Technical Committee C, of American Society for Testing Materials Committee D-2, which is identical with the industry's standing committee, recommended the adoption of the revised commercial standard CS12-33 for fuel oils. The industry has since accepted and approved for promulgation by the Department of Commerce through the Bureau of Standards, the revised standard as shown herein.

The standard became effective May 1, 1933.

Promulgation recommended.

I. J. Fairchild,
Chief, Division of Trade Standards.

Promulgated.

Lyman J. Briggs,
Acting Director, Bureau of Standards.

Promulgation approved.

Daniel C. Roper,
Secretary of Commerce.

FUEL OILS

(Second Edition)

COMMERCIAL STANDARD

SCOPE

1. These specifications cover six grades of fuel oil for various types of fuel-oil-burning equipment.

GENERAL REQUIREMENTS

2. *Properties.*[1]—Grades 1 to 4, inclusive, shall be hydrocarbon oils free from water, acid, grit, and fibrous or other foreign matters likely to clog or injure the burner or valves. Grades 5 and 6 shall be hydrocarbon oils, free from grit, acid, and fibrous or other foreign matters likely to clog or injure the burner or valves. If required, the oil shall be strained by being drawn through filters or wire gauze of 16 meshes to the inch. The clearance area through the strainers shall be at least twice the area of the suction pipe, and the strainers shall be in duplicate.

[1] Recognizing the necessity for low sulphur fuel oils used in connection with heat treatment, nonferrous metal, glass, and ceramic furnaces and other special uses, a sulphur requirement may be specified in accordance with the following table:

Oil No.	Maximum sulphur
	Percent
1	0.5
2	.5
3	.75
4	1.25
5	No limit
6	No limit

Other sulphur limits may be required only by mutual agreement between buyer and seller.

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TABLE 1.—*Detailed requirements for fuel oils, 1, 2, and 3*

[For method of test see paragraph indicated]

Grade	Flash point		Water and sediment, maximum	Pour [1] point, maximum	Distillation test			Viscosity, maximum
	Minimum	Maximum			10 percent point, maximum	End point, maximum	90 percent point, maximum	
No. 1. (A distillate oil for use in burners requiring a volatile fuel.)	110° F. or legal (Par. 3)	165° F. (Par. 4)	*Percent* 0.05 (Par. 5)	15° F. (Par. 7)	420° F. (Par. 8)	600° F. (Par. 8)	---	
No. 2. (A distillate oil for use in burners requiring a moderately volatile fuel.)	125° F. or legal (Par. 3)	190° F. (Par. 4)	0.05 (Par. 5)	15° F. (Par. 7)	440° F. (Par. 9)	---	620° F. (Par. 9)	
No. 3. (A distillate oil for use in burners requiring a low viscosity fuel.)	150° F. or legal (Par. 3)	200° F. (Par. 4)	0.1 (Par. 5)	15° F. (Par. 7)	460° F. (Par. 9)	---	675° F. (Par. 9)	Saybolt universal at 100° F. 55 seconds. (Par. 10)

[1] Lower or higher pour points may be specified whenever required by conditions of storage and use. However, these specifications shall not require a pour point less than 0° F. under any conditions.

TABLE 2.—*Detailed requirements for fuel oils 4, 5, and 6*

[For method of test see paragraph indicated]

Grade	Flash point		Water and sediment maximum		Pour point, maximum	Viscosity, maximum
	Minimum	Maximum	Water	Sediment		
No. 4. (An oil for use in burners requiring low viscosity fuel.)	150° F. (Par. 3)	([1]) (Par. 4)	*Percent* 1.0 (Par. 5)		([2]) (Par. 7)	Saybolt universal at 100° F. 125 seconds. (Par. 10)
No. 5. (An oil for use in burners permitting a medium viscosity fuel (Bunker B, Federal specification, 2d.))	150° F. (Par. 3)	---	1.0 (Par. 5)		---	Saybolt Furol at 122° F. 100 seconds. (Par. 10)
No. 6. (An oil for use in burners permitting a high viscosity fuel (Bunker C, Federal Specification, 2d.))	150° F. (Par. 3)	---	([3]) (Par. 6)	0.25 (Par. 6)	---	Saybolt Furol at 122° F. 300 seconds. (Par. 10)

[1] Whenever required, as, for example, in burners with automatic ignition, a maximum flash point may be specified. However, these specifications shall not require a flash point less than 250° F. under any conditions.

[2] Pour point may be specified whenever required by conditions of storage and use. However, these specifications shall not require a pour point less than 15° F. under any conditions.

[3] The total water plus sediment shall not exceed 2.0 percent.

METHODS OF TEST

FLASH POINT

3. *Minimum.*—The flash point, instrument, and method for determining minimum flash point shall be that legal for the locality in which the oil is sold. In absence of legal requirements, the minimum flash point shall be determined in accordance with the standard method of test for flash point by means of the Pensky-Martens closed tester as in American Society for Testing Materials D93-22.

4. *Maximum.*—Standard method of test for flash point by means of the Pensky-Martens closed tester as in American Society for Testing Materials D93-22.

WATER AND SEDIMENT

5. Standard method of test for water and sediment in petroleum products by means of centrifuge as in American Society for Testing Materials D96-30. (See tables 1 and 2.)

6. Standard method of test for water in petroleum products by means of distillation as described under method of American Society for Testing Materials, D95-30. The standard method of test for sediment shall be as described below. A deduction in quantity will be made for all water plus sediment in excess of 1.0 percent. (See table 2.)

(*a*) *Apparatus.*—Alundum (porous grade) thimbles, 1 inch in diameter by 2¾ inches high, weighing not less than 15 nor more than 17 grams.

Extraction apparatus (see fig. 1) of such construction that the thimble is completely surrounded by the vapor of the boiling solvent. Siphon extractors must not be used.

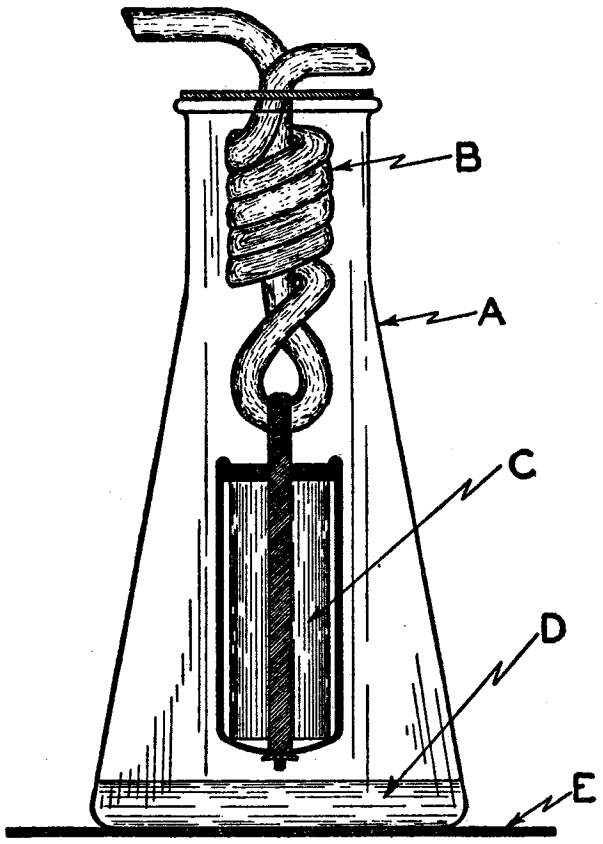

FIGURE 1.—*Extraction apparatus for determination of sediment.*

a, Extraction flask; *b*, condenser; *c*, extraction thimble; *d*, solvent; *e*, top of hot plate.

(*b*) *Procedure.*—Place approximately 10 grams of the sample in the previously extracted and dried accurately weighed thimble, and weigh to ±0.01 gram, place in the extraction apparatus, and extract with 90 percent benzol until the solvent dropping from the thimble is colorless. Dry the thimble for 1 hour at 105° C., and weigh to ±0.0001 gram. Repeat the extraction until the weight of the dried thimble and sediment is constant.

(NOTE.—The rate of extraction shall be such that the mixture of oil and benzol in the thimble does not rise to within one fourth inch of the top.)

POUR POINT

7. Tentative method of test for pour points of petroleum products as in American Society for Testing Materials D97-30.

DISTILLATION TEST

8. Standard method of test for distillation of gasoline, naphtha, kerosene, and similar petroleum products as in American Society for Testing Materials D86-30.

9. Standard method of testing gas oils as in American Society for Testing Materials, D158-28, except as to the procedure in taking readings, which shall be taken as required in these specifications.

VISCOSITY

10. Standard method of test for viscosity of petroleum products and lubricants as in American Society for Testing Materials, D88-30. The A.S.T.M. Viscosity Temperature Chart, Method D341-32T, affords a convenient means for estimating viscosities at temperatures other than those prescribed as standard test temperatures.

REFERENCES

11. Complete information regarding the procedure for making the tests specified is to be found in the publications of the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pa.

SIGNIFICANCE OF TESTS PRESCRIBED

FLASH POINT

12. The flash point of a product may be defined as the temperature to which it must be heated in order to give off sufficient vapor to form an inflammable mixture with air. This temperature varies with the apparatus and procedure employed and consequently both must be specified when the flash point of an oil is stated.

13. The minimum flash point of oils used for fuel is usually controlled by law. When there are no legal requirements, the minimum values in the table are to be employed. Maximum values are specified in oils nos. 1, 2, and 3 to insure the required ease of ignition.

WATER AND SEDIMENT

14. Water and sediment are impurities which are almost entirely excluded in fuel oils nos. 1, 2, and 3, and which are permitted in somewhat larger quantities in fuel oils nos. 4, 5, and 6. It is difficult to eliminate them entirely from this latter group of oils, and the advantage is not sufficient to justify the cost.

15. Water and sediment are determined together by the centrifuge, except with fuel oil no. 6, where water is determined by a distillation method, and sediment by extraction with benzol.

POUR POINT

16. The pour point of an oil is the lowest temperature at which it will flow when cooled and tested under prescribed conditions. Pour-point specifications are included in order that oil may be secured which will not cause difficulty in handling or in use at the lowest temperatures to which it may normally be subjected.

DISTILLATION

17. Laboratory distillation of a sample under prescribed conditions gives an index of the volatility of the oil. The 10 and 90 percent points represent, respectively, the temperatures at which 10 and 90 percent of the sample are distilled. The end point is the maximum temperature recorded by the distillation thermometer at the end of the distillation.

18. The 10 percent point serves as an index of the ease of ignition of the oil and the 90 percent point and the end point are specified to make sure that the oil will burn completely and produce a minimum amount of carbon.

VISCOSITY

19. The viscosity of an oil is the measure of its resistance to flow. Maximum limits are placed on this property because of its effect upon the rate at which oil will flow through pipe lines and upon the degree of atomization that may be secured in any given equipment.

20. Viscosity is measured as the seconds required for a definite volume of oil to pass through a small tube of specified dimensions at a definite temperature. Viscosity decreases rapidly as temperature increases, and preheating makes possible the use of oils of relatively high viscosity at normal temperatures. The Saybolt Universal Viscosimeter is used for fuel oils of fairly low viscosity and the Saybolt Furol Viscosimeter for heavier oils.

HISTORY OF THE PROJECT

The manufacturers of oil burners and many petroleum refiners had long felt the need of uniform specifications for fuel oils. The American Oil Burner Association assumed the initiative in this matter and developed specifications for six grades of fuel oils with the cooperation of the American Society for Testing Materials and the American Petroleum Institute.

In order to bring these specifications into broader use, the cooperation of the Bureau of Standards was requested. Anticipating the benefits to be derived from a commonly understood basis of quality, all interests of the industry freely participated in a well-attended general conference held in New York City, January 9, 1929, and upon recommendation of this conference the standard was accepted as an everyday guide for the production, sale, and use of fuel oils. The standard was published as Domestic and Industrial Fuel Oils, Commercial Standard CS12-29.

An adherence survey was conducted in October 1931 resulting in a reported 74 percent unweighted average adherence and numerous suggestions for the improvement of the standard. It was reaffirmed on December 29, 1931.

FIRST REVISION

On June 21, 1932, a meeting of the standing committee, composed of producers, distributors, users, and general interests of fuel oils was held in Atlantic City, N.J., to discuss the advisability of revising the commercial standard. After some discussion the committee approved a revision which was formally submitted to the committee through a letter ballot. Tabulation of replies showed a large pre-

ponderance of opinion in favor of the minor revisions, and the standard was circulated to the industry for written acceptance.

The revised standard was indorsed by practically all of the larger refiners and many oil distributors and consumers as well as the manufacturers of oil burners. Accordingly, the success of the revision was announced on March 1, 1933, and the standard became effective two months thereafter.

STANDING COMMITTEE

The original standing committee for fuel oils has been broadened to coincide exactly with section 1 of Technical Committee C of the American Society for Testing Materials Committee D-2.

Suggestions for revision or other comment for consideration of the committee may be addressed to the Division of Trade Standards, Bureau of Standards, Washington, D.C.

EFFECTIVE DATE

This revised commercial standard for fuel oils became effective on May 1, 1933.

CS12–33

ACCEPTANCE OF COMMERCIAL STANDARD

This sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date _____

DIVISION OF TRADE STANDARDS,
BUREAU OF STANDARDS,
Washington, D.C.

GENTLEMEN: Having considered the statements on the reverse side of this sheet, we accept the Commercial Standard CS12–33 as our standard of practice in the

{production [1] / distribution [1] / use [1]} of fuel oils.

We will assist in securing its general recognition and use, and will cooperate with the standing committee to effect revisions of the standard when necessary.

Signature _____

(Kindly typewrite or print the following lines)

Title _____

Company _____

Street address _____

City and State _____

[1] Please designate which group you represent by drawing lines through the other two. In the case of related interests, trade papers, colleges, etc., desiring to record their general approval, the words "in principle" should be added after the signature.

(Cut on this line)

TO THE ACCEPTOR

The following points are given in answer to the usual questions arising in connection with the acceptance form:

1. Commercial standards are commodity specifications voluntarily established by mutual consent of the industry. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The Department of Commerce has no regulatory power in the enforcement of their provisions; but since they represent the will of the industry as a whole, their provisions through usage soon become established as trade customs.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities nationally recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard, and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The function performed by the Department of Commerce in the establishment of a commercial standard is fourfold: First, to act as an unbiased coordinator to bring all branches of the industry together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard; and fourth, to add all possible prestige to the enterprise by publication and promulgation when accepted by the industry.

When the standard has been indorsed by companies representing a satisfactory majority of production, the success of the project is announced. If, however, in the opinion of the standing committee of the industry or the Department of Commerce the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

ASSOCIATIONS

American Oil Burner Association, New York, N.Y. (in principle).
Board of Fire Underwriters of the Pacific, San Francisco, Calif. (in principle).
National Association of Purchasing Agents, New York, N.Y.

FIRMS

Acroil Burner Co., Inc., West New York, N.J.
Aetna Oil Service, Inc., Louisville, Ky.
Allen & Son, George W., La Porte, Ind.
American Oil Co., The, Baltimore, Md.
American Oil Products Co., Somerville, Mass.
American Petroleum Co., Cleveland, Ohio.
American Plumbing Co., Winona, Minn.
American Thermos Bottle Co., The, Norwich, Conn.
Amsler Morton Co., Inc., The, Pittsburgh, Pa.
Anchor Post Fence Co., Baltimore, Md.
Anderson-Prichard Oil Corporation, Oklahoma City, Okla.
Armstrong, Kyle W., Columbus, Ohio (in principle).
Ashland Refining Co., Ashland, Ky.
Associated Oil Co., San Francisco, Calif.
Atlantic-Pacific & Gulf Refining Co., Wichita Falls, Tex.
Atlantic Refining Co., The, Philadelphia, Pa.
Atlas Powder Co., Wilmington, Del.
Auburn Burner Corporation, Auburn, Ind.
Auler, Jensen & Brown, Oshkosh, Wis.
Autocrat Oil Burner Corporation, Cedar Rapids, Iowa.
Automatic Burner Corporation, Chicago, Ill.
Babcock & Wilcox Co., The, New York, N.Y.
Bakeries Service Corporation, New York, N.Y.
Baker Oil Burners, Inc., Denver, Colo.
Barber Asphalt Co., The, Philadelphia, Pa.
Barnsdall Refineries, Inc., Tulsa, Okla.
Bauhan, R. W., Princeton, N.J.
Behr-Manning Corporation, Troy, N.Y.
Berry Asphalt Co., The, Chicago, Ill.
Beshore & Co., Chas., Marion, Ind.
Best Corporation, W. N., New York, N.Y.
Boxill Bruel Carbon Co., Columbia Park, Ohio.
Bradford Gasoline Co., Bradford, Pa.
Bradford Oil Refining Co., Bradford, Pa.
Braun Bros. Oil Co., Inc., Winnetka, Ill.
Brazer, Clarence W., Architect, New York, N.Y.
Brown, Tattersall, Inc., Trenton, N.J.
Brust, Peter, Milwaukee, Wis.
Buckingham, Clarence, Architect, Oklahoma City, Okla.
Byles & Weidler, Inc., Oil City, Pa.
Caloroil Burner Division, Hartford, Conn.
Canadian Westinghouse Co., Ltd., The, Hamilton, Ontario, Canada.
Carborundum Co., The, Refractory Division, Perth Amboy, N.J.
Carpenter Steel Co., The, Reading, Pa.
Carr, Inc., E. W., New Orleans, La.
Castle & Co., A. M., Chicago, Ill.
Caterpillar Tractor Co., San Leandro, Calif. (in principle).
Center Street Fuel Co., Milwaukee, Wis.
Chalmers Oil Burner Co., Minneapolis, Minn.
Chesebrough Manufacturing Co., Consd., New York, N.Y.
Cities Service Oil Affiliates, New York, N.Y.
Cleveland Steel Products Corporation, Cleveland, Ohio.
Colonial Beacon Oil Co., Inc., Everett, Mass.
Coltex Refining Co., Oklahoma City, Okla.
Combustion Oil Burner Co., Division of Milwaukee Air Power Pump Co., Milwaukee, Wis.
Commerce Petroleum Co., Chicago, Ill.
Cowgill, Sr., C. H., Blacksburg, Va.
Crew Levick Co., Philadelphia, Pa.
Cross Co., H. H., Chicago, Ill.
Crown Central Petroleum Corporation, Baltimore, Md.
Crystal Oil Works, Oil City, Pa.
Deep Rock Oil Corporation, Chicago, Ill.

De Jarnette, Charles Wagner, Des Moines, Iowa.
DeLaval Separator Co., The, Poughkeepsie, N.Y.
Detroit Edison Co., The, Detroit, Mich.
Derby Oil Co., Wichita, Kans.
Dexter Folder Co., Pearl River, N.Y.
Dietel and Wade, architects, Buffalo, N.Y.
Dodge & Morrison, architects, New York, N.Y.
Electric Boat Co., Groton, Conn.
Electric Bond & Share Co., New York, N.Y.
Electrol, Inc., St. Louis, Mo.
Empire Oil & Refining Co., Tulsa, Okla.
Engineer Co., The, New York, N.Y
Enterprise Oil Burner Co., San Francisco, Calif.
Fairbanks, Morse & Co., Beloit, Wis.
Fair-Chester Oil Co., Inc., Port Chester, N.Y.
Falley Petroleum Co., Chicago, Ill.
Franklin Creek Refining Corporation, Franklin, Pa.
Fuel Engineering Co., of New York, N.Y. (in principle.)
Fuel Oil Journal, New York, N.Y. (in principle).
Gaso Pump & Burner Manufacturing Co., Tulsa, Okla.
General Electric Co., Schnectady, N.Y.
General Petroleum Corporation of California, Los Angeles, Calif.
Gerhardt, W. F., Richmond, Va.
Globe Oil & Refining Co., The, Chicago, Ill.
Globe Oil & Refining Co., Blackwell, Okla.
Goodrich & Co., Inc., Walter H., New Haven, Conn.
Grayburg Oil Co., San Antonio, Tex.
Gray Industrial Laboratories, Newark, N.J.
Griffith-Consumers Co., Washington, D.C.
Gulf Refining Co., Pittsburgh, Pa.
Hagan Co., George J., Pittsburgh, Pa.
Hake, Harry, Architect, Cincinnati, Ohio.
Hancock Oil Co. of California, The, Los Angeles, Calif.
Hansen Snider Lumber Co., Wisconsin Dells, Wis.
Hardinge Oil Burner Co., Chicago, Ill.
Harnischfeger Corporation, Milwaukee, Wis.
Harper & West, architects and engineers, Boston, Mass.
Harrisburg Pipe & Pine Bending Co., Harrisburg, Pa.
Harrop Ceramic Service Co., Columbus, Ohio.
Hart Oil Burner Corporation, Peoria, Ill.
Heating Journals, Inc. (publishers of "Oil Heat"), New York, N.Y. (in principle).
Henry & Co., E. C., Bay City, Mich.
Hill Diesel Engine Co., Lansing, Mich.
Holmes & Sons Co., M. D., Worcester, Mass.
Honolulu Oil Corporation, Ltd., San Francisco, Calif.
Humble Oil & Refining Co., Houston, Tex.
Ingersoll-Rand Co., Phillipsburg, N.J.
International Harvester Co., Chicago, Ill. (in principle).
Joachim, Wm. F., Ridley Park, Pa.
Johnston Manufacturing Co., Minneapolis, Minn.
Kanotex Refining Co., The, Arkansas City, Kans.
King-Seeley Corporation, Ann Arbor, Mich.
Kleen Heat, Inc., Chicago, Ill.
Lincoln Oil Refining Co., Robinson, Ill.
Lindsay-McMillan Co., Milwaukee, Wis.
Little, Inc., Arthur D., Cambridge, Mass. (in principle).
Littleford Bros., Cincinnati, Ohio (in principle).
Lubrite Refining Corporation, St. Louis, Mo.
Lynch-Clarisey Co., Chicago, Ill.
Lynn Products Co., Lynn, Mass.
Malleable Iron Fittings Co., Branford, Conn.
Marathon Oil Co., Tulsa, Okla.
Maritime Oil Co., Houston, Tex.
Mayflower Oil Burner Corporation, West New York, N.J.
McAllister, R., Philadelphia, Pa.
McIlvaine Burner Corporation, Evanston, Ill.
McIlvaine Oil Burner, White Plains, N.Y.
McIntosh & Seymour Corporation, Auburn, N.Y.
Messer Co., Inc., The, Newark, N.J.
Mexican Petroleum Corporation, New York, N.Y.
Micro Corporation, The, Bettendorf, Iowa.
Midwest Oil Co., Inc., Minneapolis, Minn.
Miller Sons Co., A. D., Pittsburgh, Pa.
Misko Refineries, Inc., Laredo, Tex.
Missouri-Kansas-Texas Railroad Co., St. Louis, Mo.
Montana State College, Bozeman, Mont.
Montgomery Ward & Co., Chicago, Ill.
Montreal, City of, Montreal, Quebec, Canada.
Moore & McCormack Co., Inc.. New York, N.Y.

Motor Power Equipment Co., St. Paul, Minn.
Motor Wheel Corporation, Lansing, Mich.
National Refining Co., The, Cleveland, Ohio.
New York Central Lines, New York, N.Y.
Nordberg Manufacturing Co., Milwaukee, Wis.
North Shore Petroleum Co., Chicago, Ill.
Nu-Way Corporation, The, Rock Island, Ill.
Ohio Oil Co., The, Findlay, Ohio.
Ohio Valley Refining Co., St. Marys, W.Va.
Oil Burner Sales and Service, Manheim, Pa.
Orr, Benjamin N., New York, N.Y.
Packard Utilities Corporation, Philadelphia, Pa.
Panhandle Refining Co., Wichita Falls, Tex.
Paragon Oil Co., New York, N.Y.
Pehrson, G. A., Spokane, Wash.
Pennsylvania Oil Co. of Evanston, Evanston, Ill.
Pennsylvania Refining Co., Butler, Pa.
Pennzoil Co., The, Oil City, Pa.
Perfection Stove Co., Cleveland, Ohio.
Peterson Co., George C., Chicago, Ill.
Petroleum Heat & Power Co., Inc., New York, N. Y.
Petroleum Heat & Power Co., Stamford, Conn.
Petroleum Products, Inc., Kansas City, Mo.
Pfizer & Co., Chas., New York, N.Y.
Philadelphia Electric Co., Philadelphia, Pa.
Phillips Petroleum Co., Bartlesville, Okla.
Piper, F. Stanley, architect, Bellingham, Wash.
Plumbing News, The, Pittsburgh, Pa. (in principle).
Porter Corporation, J. E., Ottawa, Ill.
Procter & Gamble Co., Ivorydale, Ohio.
Producers & Refiners Corporation, L. R. Crawford and P. C. Spencer, receivers, Independence, Kans.
Pure Oil Co., The, Chicago, Ill.
Pure Oil Products Co., Chicago, Ill.
Pyramid Petroleum Products Co., Kearny, N.J.
Quaker Manufacturing Co., Chicago, Ill.
Quaker State Oil Refining Corporation, Emlenton, Pa.
Quality Bakers of America, New York, N.Y.
Reid, Jr., William H., architect, Billings, Mont.
Republic Oil Co., Petersburg, Va.
Richfield Oil Corporation of New York, New York, N.Y.
Rio Grande Oil Co., Los Angeles, Calif.
Rockford Drop Forge Co., Rockford, Ill.
Rockwell Co., W. S., New York, N. Y.
Rothschild, LeRoy B., architect, Philadelphia, Pa.
Royce, William, Lakeside, Mich.
Russell, Lumm & Lance, Tacoma, Wash.
Schock Independent Oil Co., Mount Joy, Pa.
Schrafft & Sons Corporation, W. F., Charleston, Boston, Mass.
Schutte & Koerting Co., Philadelphia, Pa.
Seneca Petroleum Co., Chicago, Ill.
Sewerage Commission of Milwaukee, Milwaukee, Wis.
Seymour Manufacturing Co., The, Seymour, Conn.
Shedlov Oil Burner Co., Minneapolis, Minn.
Shell Eastern Petroleum Products, Inc., New York, N.Y.
Shell Petroleum Corporation, St. Louis, Mo.
Silent Glow Oil Burner Corporation, Hartford, Conn.
Simms Oil Co., Dallas, Tex.
Simplex Oil Heating Corporation, New York, N.Y.
Sinclair Refining Co., New York, N.Y.
Skelly Oil Co., Tulsa, Okla.
Skokie Oil & Coal Co., Niles Center, Ill.
Smith Co., The H. B., Westfield, Mass.
Smith Oil & Refining Co., Rockford, Ill.
Souther Engineering Co., The Henry, Hartford, Conn.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co. (Indiana), Chicago, Ill.
Standard Oil Co. of Louisiana, New Orleans, La.
Standard Oil Co. of Nebraska, Omaha, Nebr.
Standard Oil Co. of New Jersey, New York, N.Y.
Standard Oil Co. of New York, Inc., New York, N.Y.
Standard Oil Co. (Ohio), The, Cleveland, Ohio.
Starlight Refining Co., Karns City, Pa. (in principle).
Stearns Roger Manufacturing Co., The, Denver, Colo.
Sterling Fuel Oil Corporation, Chicago, Ill.
Stoetzel, Ralph E., Chicago, Ill.
Stoll Oil Refining Co., Louisville, Ky.
Streeter & Co., D. D., Brooklyn, N.Y.

Sundstrand Engineering Co., Rockford, Ill.
Sun Oil Co., Philadelphia, Pa.
Sword & Kimber Co., Phildelphia, Pa.
Sylvestre Oil Co., Inc., Mount Vernon, N.Y.
Tate-Jones & Co., Inc., J. M. Tate, Jr., receiver, Leetsdale, Pa. (in principle).
Taylor, Edward Cray and Ellis Wing Taylor, architects, Los Angeles, Calif.
Technical Publishing Co. (Power Plant Engineering), Chicago, Ill. (in principle).
Texas Pacific Coal & Oil Co., Fort Worth, Tex.
Textile Dyeing & Printing Co. of America, Inc., Fair Lawn, N.J.
Todd Combustion Equipment, Inc., Brooklyn, N.Y.
Town & Country Oil Corporation, Mount Vernon, N.Y.
Tri-State Refining Co., Ashland, Ky.
Tuffley Burner Corporation, Buffalo, N.Y.
Ultra-Penn Refining Co., Butler, Pa.
Union Oil Co. of California, Los Angeles, Calif.
Union Oil Co. of Pennsylvania, Warren, Pa.
United Oil Manufacturing Co., Erie, Pa.
U.S. Smelting Furnace Co., Belleville, Ill.
United Refining Co., Warren, Pa.
Utah Oil Refining Co., Salt Lake City, Utah.
Vacuum Oil Co., Inc., New York, N.Y.
Vickers Petroleum Co., The, Wichita, Kans.
von Biberstein, Joseph Edward, architect, Washington, D.C. (in principle).
Wachter, Harry W., architect, Toledo, Ohio.
Wadhams Oil Co., Milwaukee, Wis.
Ward Oil Co., Inc., Tarrytown and Ossining, N.Y.
Warner-Quinlan Co., New York, N.Y. (in principle).
Waverly Oil Works Co., Pittsburgh, Pa.
Webaco Oil Co., Webster, N.Y.
Western Oil & Refining Co., by Robt. C. Gillis, receiver, Los Angeles, Calif.
White Eagle Oil Corporation, Kansas City, Mo.
White Star Refining Co., Detroit, Mich.
Willatsen, Andrew, architect, Seattle, Wash.
Williams Oil-O-Matic Heating Corporation, Bloomington, Ill.
Wilmette, Village of, Wilmette, Ill.
Winkler-Koch Engineering Co., The, Wichita, Kans.
Winton Engine Corporation, Cleveland, Ohio.
Wolverine-Empire Refining Co., Oil City, Pa.
Wood Hydraulic Hoist & Body Co., Detroit, Mich.
Worthington Pump & Machinery Corporation, New York, N.Y.
York Oil Burner Co., York, Pa.

GOVERNMENT

U.S. Department of Agriculture, Washington, D.C.
Post Office Department, Washington, D.C.
National Advisory Committee for Aeronautics, Washington, D.C. (in principle).
U.S. Treasury Department, Washington, D.C.
Veterans' Administration, Washington, D.C.
War Department, Washington, D.C.

COMMERCIAL STANDARDS

CS No.	Item
0-30.	The commercial standards service and its value to business.
1-32.	Clinical thermometers (second edition).
2-30.	Mopsticks.
3-28.	Stoddard solvent.
4-29.	Staple porcelain (all-clay) plumbing fixtures.
5-29.	Steel pipe nipples.
6-31.	Wrought iron pipe nipples (second edition).
7-29.	Standard weight malleable iron or steel screwed unions.
8-30.	Plain and thread plug and ring gage blanks.
9-33.	Builders' template hardware (second edition).
10-29.	Brass pipe nipples.
11-29.	Regain of mercerized cotton yarns.
12-33.	Fuel oils (second edition).
13-30.	Dress patterns.
14-31.	Boys' blouses, button-on waists, shirts, and junior shirts.
15-29.	Men's pajamas.
16-29.	Wall paper.
17-32.	Diamond core drill fittings (second edition).
18-29.	Hickory golf shafts.
19-32.	Foundry patterns of wood (second edition).
20-30.	Staple vitreous china plumbing fixtures.
21-30.	Interchangeable ground glass joints.
22-30.	Builders' hardware (nontemplate).

CS No.	Item—Continued
23-30.	Feldspar.
24-30.	Standard screw threads.
25-30.	Special screw threads.
26-30.	Aromatic red cedar closet lining.
27-30.	Plate glass mirrors.
28-32.	Cotton fabric tents, tarpaulins, and covers.
29-31.	Staple seats for water-closet bowls.
30-31.	Colors for sanitary ware.
31-31.	Red cedar shingles.
32-31.	Cotton cloth for rubber and pyroxylin coating.
33-32.	Knit underwear (exclusive of rayon).
34-31.	Bag, case, and strap leather.
35-31.	Plywood.
36-31.	Fourdrinier wire cloth.
37-31.	Steel bone plates and screws.
38-32.	Hospital rubber sheeting.
39-32.	Wool and part wool blankets.
40-32.	Surgeons' rubber gloves.
41-32.	Surgeons' latex gloves.
42-32.	Fiber insulating board.
43-32.	Grading of sulphonated (sulphated) oils, saponifiable types.
44-32.	Apple wraps.
45-33.	Douglas fir plywood.
46-33.	Hosiery lengths.

NOTICE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice in their industry may secure copies of the above standards, while the supply lasts, by addressing the Division of Grade Standards, Bureau of Standards, Washington, D.C.